

**MINUTES  
of the  
FOURTH MEETING  
of the  
SCIENCE, TECHNOLOGY AND TELECOMMUNICATIONS COMMITTEE**

**September 4-5, 2014  
Wooton Hall  
New Mexico State University  
Las Cruces**

The fourth meeting of the Science, Technology and Telecommunications Committee for the 2014 interim was called to order by Senator Michael Padilla, chair, on Thursday, September 4, 2014, at 9:19 a.m. in Wooton Hall at New Mexico State University (NMSU) in Las Cruces.

**Present**

Sen. Michael Padilla, Chair  
Rep. Carl Trujillo, Vice Chair  
Sen. William F. Burt (9/4)  
Rep. Kelly K. Fajardo (9/4)  
Rep. Jason C. Harper  
Sen. Linda M. Lopez  
Rep. James E. Smith  
Rep. Monica Youngblood

**Advisory Members**

Sen. Carlos R. Cisneros  
Sen. Richard C. Martinez  
Sen. Mary Kay Papen (9/5)  
Rep. Jane E. Powdrell-Culbert

**Absent**

Rep. Roberto "Bobby" J. Gonzales  
Sen. Bill B. O'Neill  
Rep. Debbie A. Rodella  
Sen. John C. Ryan  
Rep. Luciano "Lucky" Varela

Rep. Stephanie Garcia Richard  
Sen. Phil A. Griego  
Sen. Ron Griggs  
Sen. Timothy M. Keller  
Rep. Bill McCamley  
Sen. Steven P. Neville  
Sen. William H. Payne  
Rep. Nick L. Salazar  
Rep. Don L. Tripp  
Sen. Peter Wirth

(Attendance dates are noted for members not present during the entire meeting.)

**Staff**

Gordon Meeks, Legislative Council Service (LCS)  
Renée Gregorio, LCS  
Carolyn Ice, LCS

**Guests**

The guest list is in the meeting file.

**Handouts**

Handouts and other written testimony are in the meeting file and posted on the legislature's web site.

**Thursday, September 4**

Senator Padilla thanked NMSU for hosting the committee. The meeting began with introductions from members of the committee and members of the LCS staff. Approval of the minutes from July and August was postponed until the arrival of more voting members.

**Welcome and Update on Issues of Interest to NMSU**

Garrey Carruthers, Ph.D., president, NMSU, gave the committee an overview of the university's current research and ongoing projects. NMSU is currently engaged in a variety of projects to improve the university's involvement with the community and encourage both in-state and out-of-state students to enroll at the university.

Dr. Carruthers told the committee that NMSU was the recipient of a private donation that allowed the university to complete installation of artificial turf in Aggie Memorial Stadium. The university received some negative feedback on the new turf because of NMSU's reputation as an agricultural school; however, Dr. Carruthers said, artificial turf is a common feature of most athletic fields around the country.

He went on to speak about the new Burrell College of Osteopathic Medicine, which will make NMSU the third land grant university with a medical school. The medical school will not be funded by the university; instead, it will be funded by Santa Fe real estate and mining developer Dan Burrell and his family. Construction is expected to begin in February 2015, and the school is projected to be completed and ready to open by September 2016. Dr. Carruthers told the committee that there will be a site visit by the accrediting agency for provisional accreditation later this month.

In addition to the completion of the stadium improvements and the plans for the medical school, NMSU plans to construct a community park east of the football stadium and renovate its weight facility and baseball field. Ground was broken for the NMSU Spiritual Center in April 2014, which will serve as a place for all students, regardless of faith.

Dr. Carruthers also discussed the increase in the minimum grade point average (GPA) required for admission to the university. The required minimum GPA will be raised from 2.5 to 2.75 starting in the fall of 2016. Dr. Carruthers predicts that enrollment will decrease after the GPA increase, but he is confident that this change will help make NMSU a more competitive university nationally and that enrollment will eventually increase.

Questions and discussion topics of the committee members included:

- microbreweries and wineries and research in hops production;
- the Chile Pepper Institute;
- an extension office in Valencia County for master gardening;
- the "Aggie Pathway to the Baccalaureate" initiative;
- student demographics;
- admissions standards;
- graduation standards;
- enrollment statistics;
- the dual credit program;
- the National Merit Scholarship and national Hispanic scholarships;
- the higher education funding formula;
- energy efficiency initiatives;
- New Mexico universities' recruiting of New Mexico students;
- partnerships with large companies to develop hops research;
- an on-campus hotel;
- the retirement community on campus;
- enhanced vocational education at four-year institutions; and
- risk averseness.

#### **Department of Information Technology (DOIT) Project Spreadsheet Summary Update**

Darryl Ackley, secretary of information technology, provided the committee with an overview of the DOIT and a status report on its current activities. He reviewed the Enterprise Project Management Office's (EPMO's) top 10 project financials summary and the projects' respective estimated completion dates. Secretary Ackley told the committee that the DOIT is internally discussing the best way to present new information to the committee.

The EPMO is responsible for providing support, guidance and oversight on information technology (IT) projects and procurements to promote improved outcomes. The total cost of the EPMO focus portfolio top ten is \$284,731 and includes the following projects:

- the Oil and Natural Gas Administration and Revenue Database (ONGARD) modernization;
- the New Mexico Broadband Program;
- the GenTax upgrade;
- the State Land Office Land Information Management System;
- the Enterprise Provider Information Constituent Services (EPICS);
- the Medicaid Management Information System;
- the Automated System Program and Eligibility Network (ASPEN) state-based marketplace;
- the Motor Vehicles Division system modernization;
- the Statewide Interoperable Radio Communication Internet Transport System; and

- the Human Services Department ASPEN.

Secretary Ackley provided the committee with a breakdown of the cost of each of the 10 projects, in addition to each project's current status and milestones reached.

Questions and discussion topics of the committee members included:

- ONGARD expansion;
- centralization of state IT systems;
- the DOIT's involvement in database centralization; and
- ASPEN transition to maintenance operations.

### **Public Safety Broadband (PS Broadband)**

Secretary Ackley and Jacqueline Miller, deputy secretary, DOIT, presented a report on PS broadband and emphasized its importance in emergency situations. The DOIT's vision is to provide emergency responders with the first nationwide, high-speed, wireless broadband network dedicated to public safety. Ms. Miller emphasized the importance of having a separate network for public safety responders who require the right information in real time in order to save lives and property.

The establishment of a national PS broadband network was included in the federal Middle Class Tax Relief and Jobs Creation Act of 2012. Seven billion dollars was allocated for deployment and operations, with \$135 million allocated for state implementation planning. PS broadband for New Mexico is projected to be completed by the end of August 2015.

Public safety long-term evolution (PS LTE) will provide public safety responders with real-time data and allow greater efficiency. The proposed PS LTE data center will be located in Santa Fe, with tower sites in various areas of the state. A greater concentration of tower sites will be located in the southern part of the state near the Mexico border. In regard to funding, Ms. Miller told the committee that PS broadband will be funded by FirstNet, which will fund the infrastructure and offer network access pricing that is comparable to commercial carrier networks.

Key learning conditions unique to New Mexico include the following:

- use of a network core located remotely;
- spectrum management and network use issues along the border of the United States and Mexico; and
- shared use of a state network with local, state, tribal and federal users.

Ms. Miller told the committee that discretion to strategically placed network assets will produce the greatest benefits for early PS LTE adopters. She went on to say that the PS LTE data network will be free from all consumer traffic, and cellular capability will have speeds up to 30

megabits per second. PS broadband allows "state, federal, tribal and local responders to participate in a largely funded program with the intent of communicating more effectively at the grassroots level".

Questions and discussion topics of the committee members included:

- funding for PS broadband;
- comparison with the Mexican system;
- testing and implementation;
- federal requirements for cell service maintenance;
- a consortium of private and public organizations to coordinate broadband deployment;
- the possibility of expanding infrastructure more rapidly;
- the possibility of using existing infrastructure;
- tribal partnerships and outreach;
- Native American infrastructure deployment;
- applications in telemedicine and education; and
- the inability to connect.

#### **Children, Youth and Families Department (CYFD) IT Systems**

Secretary Ackley, Damien Aragon, chief information officer, CYFD, and Vicki Gallegos, deputy director of the EPICS program for the CYFD, presented an overview of the EPICS Master Project. EPICS is a multiyear, phased project and enterprise web-based system designed to meet the needs of all CYFD program areas and the needs of CYFD clients. The project's current budget is \$10.5 million.

Mr. Aragon and Ms. Gallegos informed the committee that the first two phases of the project are complete and focus on provider and client management. Phase three is currently on target, but phases four and five are unfunded.

The objectives of the EPICS program are as follows:

- improving program performance and efficiency;
- increasing safety, security and accountability;
- implementing an enterprise web-based system; and
- reducing agency costs.

Questions and discussion topics of the committee members included:

- funding for the last phases;
- use of iPads in the field;
- raw data accessibility;
- cooperation with the Public Education Department;

- data backups;
- assistance with funding; and
- earmarking money for support to specific families.

### **Approval of Minutes**

The meeting minutes from July and August were approved.

### **Workforce Solutions Department (WSD) Information Systems**

Sue Anne Athens, chief information officer, WSD, gave the committee a walk-through of the unemployment insurance (UI) claim process. Ms. Athens told the committee that the WSD is currently trying to expand its framework beyond UI tax and has spent money to create applications and infrastructure to support the process.

Ms. Athens told the committee that improper payments and UI fraud has decreased by 60% with the new system. New Mexico's UI program is also ranked number one in the United States by the United States Department of Labor (USDOL) for quality of claims determinations. Ms. Athens assured the committee that service levels have greatly improved with the new system with very few disruptions of service.

Ms. Athens then spoke about uDetect Predicative Analytics, a project meant to improve detection and achieve a reduction of overpayment fraud through the use of uDetect™, a customizable, analytical system used to identify UI claims with a higher propensity to involve fraudulent activity. The project is a proactive attempt to identify new types of fraud and outliers. uDetect Predicative Analytics is divided into four phases. Phases one through three focus on the technology involved in the project while phase four focuses on business workload prioritization.

In addition to the uDetect Predicative Analytics project, the Consortium Project is aimed at reducing the cost of new enhancement development through code sharing and collaboration, improved modernization efforts and the provision of means to conduct joint demonstration projects in an isolated environment to avoid jeopardizing customer data. The site has already been established. Ms. Athens told the committee that expansion to other states is highly likely, with potential for additional funding by the USDOL.

Questions and discussion topics of the committee members included:

- cross-training;
- cost savings through paper reduction;
- joint project management;
- work with the DOIT; and
- call center performance.

## **State Private Equity Investing for Technology Commercialization**

Dr. Carruthers talked to the committee about the shortage of investment and of intellectual property. Dr. Carruthers expressed the need for early-stage capital to move university discoveries and innovation to market; however, moving the outputs of these technology assets has proven difficult.

Dr. Carruthers then shared with the committee NMSU's attempt to mitigate these challenges through the Launch: Proof of Concept Center. The center's purpose is to help speed up the acceleration of technologies to market through seed grant funding, business assistance and entrepreneurial expertise.

The proposed legislation for the 2015 legislative session involves amending a section of the Severance Tax Bonding Act to require the State Investment Council (SIC) to invest 0.25% of the market value of the Severance Tax Permanent Fund. The money would then be used to invest in promising businesses, based on technologies from the three research universities in the state, and fund a technology vetting process for the Technology Research Collaborative.

Steven K. Moise, state investment officer, SIC, then gave the committee an overview of the current status of the SIC. The SIC is responsible for managing New Mexico's \$18 billion permanent endowment. Mr. Moise told the committee that the total assets under management reached a record high for fiscal year (FY) 2014 of \$19.8 billion, from \$14 billion in FY 2010. The FY 2014 investment returns totaled 15.9%. The projected FY 2016 total distributions are \$845 million. The SIC believes that fund growth will lead to greater benefits for the state.

Mr. Moise admitted that it is difficult to determine the market outlook for the next 10 years and discussed the inconsistent contributions to the Severance Tax Permanent Fund while there are strong contributions every month to the Land Grant Permanent Funds.

Brian Birk, Sun Mountain Capital, followed Mr. Moise's presentation with an overview of the New Mexico Private Equity Investment Program (NMPEIP). The program was "established in 1993 to make investments into private equity funds which in turn invest into NM-based companies". Since 2004, the NMPEIP has been managed with financial returns as a primary focus. Sun Mountain Capital is the program advisor.

Mr. Birk gave the committee an update on the NMPEIP, which includes the following points.

- The program is in compliance with the statute (Section 7-27-5.15 NMSA 1978).
- NMPEIP financial returns are steadily improving.
- Program funds and portfolio companies continue to progress.
- The NMPEIP is having a significant, positive impact on New Mexico's economy.
- The program is currently evaluating potential new commitments per the approved pacing plan.

Questions and discussion topics of the committee members included:

- the possibility of Tesla Motors, Inc., in New Mexico;
- the actual return on investment;
- the amount of money that goes to bonding;
- the benefit to New Mexico;
- ABQid, Inc., and Innovate ABQ;
- funding for ABQid, Inc., and Innovate ABQ;
- funding entrepreneurs;
- the use of private equity investments;
- different sources of available funding;
- return on investment;
- cause of reduced contributions to the Severance Tax Permanent Fund;
- legislative action;
- benchmarks used by Sun Mountain Capital;
- commercial and economic validation processes for investments; and
- the use of the Land Grant Permanent Funds instead of the Severance Tax Permanent Fund.

### **Smart Grid Epicenter at NMSU**

Enrico Pontelli, associate dean, College of Arts and Sciences, NMSU, and Satish Ranade, Klipsch School of Electrical and Computer Engineering, NMSU, spoke about their plans to establish a Smart Grid Epicenter at NMSU. Both Dr. Pontelli and Dr. Ranade gave the committee a brief overview of the existing grid systems and the problems associated with the current systems. They emphasized problems with sustainability as well as the current system's inability to meet the increasing demands of consumers. They added that the current system is environmentally unfriendly and inefficient. They hope that their collaboration will serve as the conduit to develop a broad culture of smart grids at NMSU.

NMSU is currently conducting foundational research through electrical and computer engineering, computer science and economics. The National Science Foundation's Centers of Research Excellence in Science and Technology recently awarded the program a \$5 million, five-year grant. Dr. Pontelli and Dr. Ranade will also serve as co-directors for the Interdisciplinary Center of Research Excellence in Design of Intelligent Technologies for Smart Grids (iCREDITS). iCREDITS will bring together a coalition of experts from various fields and serve as an epicenter for research and training on smart grids.

Questions and discussion topics of the committee members included:

- electricity as open net;
- the energy storage role and demand response;
- the stability of the grid, as well as its reliability;
- the cost per kilowatt-hour for storage; and



- the Los Alamos National Laboratory/Japanese grid study.

### **New Mexico Water Resources Research Institute (NMWRRI) Update**

Sam Fernald, director, NMWRRI, provided the committee with a brief history on the NMWRRI and its current status. Mr. Fernald told the committee that the NMWRRI was established in 1963 as a response to droughts in the 1950s in New Mexico. The NMWRRI is meant to provide research and training, transfer water information, provide expertise and specialized assistance and cooperate with local, state and federal water agencies. Water institutes have been established in every state based on the New Mexico model.

The gravity recovery and climate experiment measures short-term gravity fluctuation; water is the primary cause of changes in gravity. Ground water extractions in New Mexico currently exceed water recharge, and existing water budgets are static and imprecise. Mr. Fernald told the committee that more research must be conducted in order to complete a statewide water assessment and develop a statewide water budget.

The NMWRRI is currently funded by an additional \$101,000 to the recurring base of \$317,000, with a \$1 million, one-time water initiative. The NMWRRI approves funding projects through a program development review board, peer reviewers, conference committees and statewide water assessment teams. For FY 2016, the NMWRRI is submitting an expansion request of \$2 million per year to conduct further water research.

Questions and discussion topics of the committee members included:

- precipitation and evaporation model comparisons;
- market need in different communities;
- brackish aquifers;
- membrane development at Sandia National Laboratories;
- cooperation with small water companies and water cooperatives;
- sustainability on a household level; and
- middle Rio Grande water replenishment.

### **Recess**

The meeting recessed at 5:15 p.m.

### **Friday, September 5**

### **Spaceport America Status Report**

Christine Anderson, executive director, Spaceport Authority, gave the committee a presentation on the commercial space industry and the current projects of Spaceport America, which is located near White Sands Missile Range.

Ms. Anderson defined the commercial space industry as a "flight beyond the Kármán Line that is conducted and paid by an entity other than a government agency". She went on to say that the industry is expanding due to the appeal of space development, and current technology is creating more opportunities for customers outside of the military. Current leaders of the commercial space industry include entrepreneurs such as Elon Musk, Richard Branson and Jeff Bezos, who see the industry as an outlet for exploration, pioneering, revenue and human preservation.

Spaceport America is owned and operated by the State of New Mexico. So far, Spaceport America has generated more than 1,300 jobs, and more than half of the operations budget has been covered by revenue for the past three years. It is considered the world's first purpose-built commercial spaceport, with two launch tenants — Virgin Galactic and Space Exploration Technologies Corporation (SpaceX) — and with 20 launches to date. Spaceport America supports both vertical and horizontal launches, which is not a common feature of many spaceports. Currently, there are eight spaceports located within the United States, with 11 other spaceports proposed in various regions of the country.

Ms. Anderson told the committee that Spaceport America is currently preparing for the launch of the SpaceX Falcon 9 rocket, a reusable rocket. Spaceport America is also preparing for Virgin Galactic's first flight, with other flights currently in the discussion phase. The Gateway Gallery is scheduled to open in January 2015, with completion of the new front gate in February 2015 followed by the opening of the visitor center departure point in December 2015. Ms. Anderson then spoke about the 24-mile unpaved southern road, which branches off from Interstate 25 north of a United States Border Patrol checkpoint. Construction of the southern road has been delayed due to the discovery of 40 archaeological sites, procurement of a contractor, mitigation and land acquisition. The proposed groundbreaking will take place in either March or April of next year.

Questions and discussion topics of the committee members included:

- lodging/hotels;
- water issues/constraints;
- implications for Truth or Consequences;
- the schedule for the first flight;
- additional funding anticipated to be requested during the 2015 legislative session;
- advertising agency revenue;
- the number of visitor centers and their locations;
- proprietary information protection;
- a paleohydrology study;
- southern road construction; and
- the potential for the southern road to be converted to state highway status.

## **Science, Technology, Engineering and Mathematics (STEM) Education Entrepreneurship and STEM Diversity**

Dr. Pontelli gave the committee a brief overview of STEM education and the current need for STEM jobs in New Mexico and in the United States. Dr. Pontelli told the committee that, nationally, there are 26 million STEM jobs, with an expected growth of 1.2 million more jobs by 2018. There is also a specific emphasis on engineering and computer science; however, most students lose interest in STEM education by their senior year of high school. The loss of interest often continues into college, with over 48% of college freshmen abandoning their STEM paths.

Dr. Pontelli attributes the decreased participation in STEM to academic gaps in science and mathematics education in high school, disadvantages in early preparation for STEM college courses, socialization patterns and lack of support from role models and families. NMSU is attempting to establish a STEM training, entrepreneurship and diversity (STEMED) program, designed to serve kindergarten through age 20 audiences statewide, that addresses the demand for individuals in STEM fields of employment.

Marie Bochert, education specialist, Arrowhead Center, NMSU, spoke to the committee about the Southern New Mexico Science, Engineering, Mathematics, and Aerospace Academy (SEMAA). The program encourages underrepresented students in grades kindergarten through 12 to pursue interests in STEM fields through after-school programs and activities such as the Aerospace Education Lab and Moon Buggy Race Competition. The program "engages students in inquiry-based learning, research, use of technology, peer support groups, and mentoring relationships with professionals in STEM". SEMAA also facilitates the successful transition of students from high school to post-secondary programs.

Ms. Bochert went on to tell the committee about the Young Women in Computing program designed to engage and train young women in the pursuit of an education in computing. The various programs are all intended to help students apply learned STEM concepts to real-life situations through complex problem solving and entrepreneurial thinking.

Susan Brown, associate professor, College of Education, NMSU, continued the presentation by speaking on behalf of the Innoventure Program, which works with middle school and high school students. The program encourages students to develop teams and build functional prototypes of products with an accompanying business plan for product development.

The overarching STEMED goals at NMSU include:

- creating an institution-wide umbrella for STEM education;
- sharing and replicating, as well as adapting, successful efforts; and
- integrating STEM into other areas of education.

Questions and discussion topics of the committee members included:

- African American participation in STEM programs and statewide interest in STEM;
- target groups;
- increasing outreach in the community;
- expanding into elementary and middle schools in Albuquerque;
- current funding;
- a funding request for umbrella programs;
- legislative action;
- requiring students to take computer science classes;
- the relationship with and participation of teachers;
- improving the dual credit system;
- parent involvement; and
- the current operating budget.

### **Appropriate Technology Water Treatment Systems**

Dr. Antonio Lara, chemistry professor, NMSU, discussed the current research at NMSU concerning uranium abatement for contaminated water from unregulated sources. Dr. Lara told the committee that, currently, 30% of the population within the Four Corners region has unregulated water. This proportion of the population often lives in isolated and remote areas without electricity.

Although uranium is a naturally occurring element, mining activities can increase human exposure, which is intensified by processing and transporting ore during various weather conditions. Uranium particles can then be transferred to ground water through rainwater.

Dr. Lara's research involves the chemistry of natural and synthetic phyllosilicates. By using cation exchange, Dr. Lara is able to chemically alter clays and change their catalytic properties. This particular project involves the use of phyllosilicates found in various clay samples in different areas of New Mexico. The clay pellets he has created remove uranium from contaminated water. Upon contact with uranium-contaminated water, the pellets exchange one positively charged uranium ion in the water for two positively charged sodium ions within the clay. The pellets are very robust, manageable, inexpensive and disposable.

Dr. Lara hopes that the pellets can be produced by Navajo Nation chapters that have been directly affected by uranium contamination in order to promote entrepreneurship and sustainability in the region. Dr. Robert Marquez, NMSU, presented information on his related research with ceramic candle filters, which are based on the Potters for Peace ceramic water filters used in various countries to remove pathogens and particulates from water. Dr. Marquez told the committee that his candle filters are easy to manufacture, ship and maintain. He also went on to say that his candle filters can be packed with clay pellets to further remove impurities from water.

Questions and discussion topics of the committee members included:

- disposal of pellets;
- resources needed to complete the projects;
- air quality applications;
- removal of pathogens in water;
- future plans of the program;
- an entrepreneurship role;
- funding requests; and
- communication with the federal Environmental Protection Agency.

**Adjournment**

There being no further business before the committee, the meeting adjourned at 12:13 p.m.